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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,031	05/10/2001	Hiroshi Suzuki	1163-0339P	4624

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EXAMINER
ESPLIN, DAVID B #6
ART UNIT
PAPER NUMBER

2851

DATE MAILED: 05/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/852,031

Applicant(s)

SUZUKI ET AL.

Examiner

D. Ben Esplin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2001.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48, 51-63, 65-67 and 74-83 is/are rejected.
- 7) ☒ Claim(s) 16, 24-27, 29, 42, 49, 50, 61, 64-66 and 68-73 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

In claim 7, the stacking of a low dispersive and a high dispersive medium in the reflective part is not found in the drawings.

From claim 46, an embodiment showing the refracting optical part directing light through one exit pupil to the center of the reflecting part, and light through another exit pupil directed to the periphery of the reflecting part is not found in the drawings.

In claim 54, the claimed arrangement of the system, wherein the optical axis is higher than the intersection point of the relay lens, is not shown in the drawings.

In claim 63, the claimed device, in which the first, second and third reflecting part mounting mechanisms contact the reflecting front surface is not shown in the drawings.

From claim 68, a temperature sensor for sensing an environmental temperature is not shown in the drawings.

No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims 16, 24-27, 29, 42, 61, 65, and 66 are objected to because of the following informalities:

In claim 16, the word a should be added before "first lens means" and before "second lens means".

In claims 24-27, the number [12] should be replaced with the number 21, it is assumed, for the purposes of examination, that the applicant meant for these claims to depend from claim 21, and not claim 12, since they contain subject matter similar to that of claim 21 and not claim 12.

In claim 29, the word a should be added before "marginal ray".

In claim 42, the phrase [image display image] should be replaced with image display device.

In claim 46, an embodiment wherein the refracting optical part includes two exit pupils.

In claims 60 and 61, on the second line of both claims, the word [form] should be replaced with the word from.

In claim 65, on the first line, the term "wherein witch" is grammatically incorrect.

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In claim 66, the closing phrase "on said retaining mechanism and said retaining mechanism" is grammatically incorrect.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 32, 33, 46, and 63 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring to claims 32 and 33, various components in the reflecting and refracting optical parts are chosen based upon a thickness limiting value. In the specification the method of calculating this thickness limiting value, and its physical significance in the image display device are not described in such a manner that one skilled in the art would be able to make and/or use the device with a reflecting or refracting part chosen to correlate with the thickness limiting value.

In reference to claim 46, the refracting optical part is claimed as having two exit pupils while the refracting optical part shown in the drawings and disclosed in the specification has only one exit pupil and is not enabling for the two exit embodiment of claim 46.

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Regarding claim 63, an embodiment wherein the first, second and third reflecting part mounting mechanisms are in contact with the reflecting front surface is not found in the disclosure. FIG. 70B clearly shows that the first reflecting part mounting mechanism is disposed underneath the reflecting front surface, not in direct contact with the surface. Thus the disclosure would not enable one skilled in the art to make and/or use the claimed invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 22, 23, 44-46, 51-56, 58-63, 67, and 77-83 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 8, the curvature of the reflecting part is described as "large" around the optical axis, becoming "smaller" towards the periphery. The use of the words "large" and "small", lacking a specific range for either within the disclosure, or some other means for assigning a well-defined scope, are found to be unclear with respect to the amount of curvature present in the reflecting part.

Regarding to claim 22, in claim 21 the retro-focus optical system is claimed as being composed of a positive power and a negative lens group. Claim 22 then claims that the retro-focus optical system of claim 21 is composed of two positive power lens groups and one negative power lens group. Since "composed" is a closed transitional phrase, claim 22 states that the retro-focus optical system consists of both a positive power lens and negative power lens

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group, and two positive power lens groups and a negative power lens group simultaneously.

Thus rendering claim 22 unclear.

Claim 23 fails to further limit the structure and/or function of the image display device claimed in claim 21 from which it depends.

Claim 44 is incoherent and replete with grammatical errors.

In reference to claim 45, it is understood that a plane mirror is a flat reflecting surface. Hence, the limitation that a plane mirror has a surface configuration for correcting distortion is confusing because a flat reflecting surface is not configured to correct distortion.

Further referring to claim 46, the refracting optical part is claimed as having two exit pupils while the specification discloses only one exit pupil, rendering claim 46 unclear.

Still further referring to claims 51-56, the bounds of the space defined in claim 51 are not stated in a clear, concise, and coherent manner. Furthermore, claim 51 depends from the "image display means" of claim 20, while claim 20 does not claim an image display means, but an image display device. It appears as though two spaces are defined, and neither is laid out in a specific manner. Claims 52-56 are rendered indefinite because they depend from claim 51.

Yet still further referring to claim 53, the optical axis of the converging optical system is claimed as parallel to the light receiving surface of the display means and the bottom. However, in claim 51, from which 53 depends, the bottom and the light receiving surface are claimed as perpendicular, making it impossible for an optical axis to be parallel to both.

Additionally, regarding claims 58, 60, and 61, the limitation that the protrusion is located "close to" an optical axis, but spaced a predetermined distance away, is unclear. The

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specification does not further help to define what this predetermined distance might be, nor does it provide information concerning what is meant by "close to".

Claims 59, 62, and 63 depends from claim 58 and thus inherits the unclear subject matter found therein.

Claim 67 refers to a lens-barrel temperature, implying that the temperature of a lens barrel is taken. However, there is no lens barrel found in the claimed subject matter, making the taking of a lens-barrel temperature confusing.

Referring to claim 79, it is stated that the connector has the same height as the image display device. However, the connector is claimed as a component of the image display device, making whatever height it is placed at the height of the image display device.

Referring to claim 81, the incoming path and the outgoing path are brought "into alignment". The meaning of the phrase "into alignment" is unclear with respect to how the light paths are aligned. The specification also fails to provide what aligning these light paths entails.

Referring to claim 82, the term "jig display means" is not art recognized and is not explained sufficiently in the specification, rendering it unclear.

Regarding claim 16, the word "means" is preceded by the word(s) "first lens" and "second lens" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

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Regarding claim 77, the word "means" is preceded by the word(s) "display" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

Claims 78-80 and 83 depend from claim 77 and inherent the rejectable subject matter found therein.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese patent application laid open H09-138349 A to Masaaki.

Masaaki discloses several embodiments of a display device in FIGS. 1-7. This device includes a convex, aspherical mirror 14 which has a larger radius of curvature in the center than toward the periphery. Masaaki also teaches of the use of a refracting optical part which may include various lenses, such as the projection lens 13. Masaaki also shows that a plane mirror 15

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may be used for projecting the light onto the screen 16. Furthermore the device of Masaaki is retained inside of the case 400, making is a one piece structure.

Claims 21-27, 29, 39, 40, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,716,118 to Sato et al.

Sato discloses an imaging optical system including the positively powered optical system 4 (see FIGS. 33A and 33B), which is a concave mirror (col. 15 lines 6-10), and, in FIGS. 1-12, various configurations of projection lenses with different lens groupings of positive and negative power. The lenses being chosen to align, magnify, and focus light emanating from the object OBJ.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki as applied to claims 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 above, and further in view of U.S. Patent No. 4,969,730 to van den Brandt.

The display device of Masaaki, in FIG. 7, teaches of the use of the transmissive liquid crystal panels 704a, 704b, and 704c, and not reflective light valves, as is claimed in claim 3. The

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patent to van den Brandt discloses an image projection arrangement that includes the reflective image display panels 10, 50, and 60 (see FIG. 2), which may be liquid crystal panels (col. 4 lines 7-8). Thus showing that the use of reflective light valves for providing information to projection light was well known in the art. In view of van den Brandt it would have been obvious to replace an imaging system using transmissive light valves with a system using reflective light valves in the device of Masaaki as an art recognized equivalent.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki as applied to claim 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 above, and further in view of U.S. Patent No. 5,274,406 to Tejima et al.

The use of a Fresnel mirror in the described display device is not found in Masaaki. Tejima teaches that a Fresnel mirror has an effect similar to that of a curved mirror in an image projector (col. 11 lines 54-57). Therefore, it would have been obvious to one skilled in the art to substitute a Fresnel mirror for the aspherically curved mirror found in the device of Masaaki as an art recognized substitute.

Claim 17 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki as applied to claims 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 above, and further in view of U.S. Patent No. 3,938,775 to Sarofeen.

While Masaaki is silent as to the composition of both the reflecting and refracting optical parts, Sarofeen discloses a mold assembly for casting synthetic lenses, demonstrating that the use of synthetic resin for manufacturing optical components was well known in the art. Furthermore,

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the patent to Sarofeen shows that it would have been obvious to one skilled in the art to make the components of either the reflecting or refracting optical parts from a synthetic resin as an art acknowledged material of manufacture.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki as applied to claims 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 above, and further in view of U.S. Patent No. 6,233,024 to Hiller et al.

In FIGS. 1, 3, and 6, Masaaki shows a plane mirror disposed at an angle with respect to the screen. However, Hiller shows a deflecting mirror 3 disposed at different angles with respect to the screen 2 in FIGS. 1, 2, 3, and 5. In view of the teaching of Hiller that the angle between the deflecting mirror and the screen may be varied, it would have been obvious to one skilled in the art to dispose the plane mirror parallel to the screen in the device of Masaaki as an art recognized equivalent to placing these two components at an angle.

Allowable Subject Matter

Claims 49, 50, 64, 68-73 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Referring to claim 49 and 50, the inclusion of a cover glass, provided specifically for protecting a light emitting surface only, disposed along with a compensator glass, which may be detachable, for correcting any distortion caused by the cover glass is not found in the prior art.

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Referring to claim 64, while various forms of focusing and distortion minimizing systems are found in the prior art, the combination of two sliding supports, a first and second mounting plate, and a piezoelectric element disposed for moving the mounting plates and is controlled by a voltage, is not found in the prior art.

Claims 68-73 depend from claim 64 and therefore include the novel subject matter found therein.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,194,884 to Parker et al. discloses an image projection system which includes a convex mirror.

U.S. Patent No. 6,276,802 to Naito discloses a rear projection system in which the display screen is parallel to one plane mirror, and nearly parallel to another plane mirror.

Japanese patent application laid open H59-010902 A to Akira discloses a multimirror projector which uses Fresnel mirrors to project an image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. Ben Esplin whose telephone number is (703) 305-4022. The examiner can normally be reached on Mon.-Fri. (8am-4:30 pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on (703) 308-2847. The fax phone numbers for the

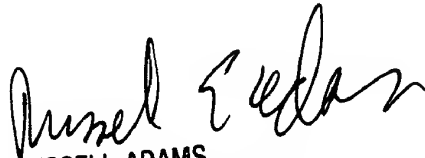
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organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


DBE
May 6, 2002


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